Patent application of

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For:

" Artillery Shell, Satellite Launcher, & Global Reach Missile "

TITLE: " **Artillery Shell, Satellite Launcher, & Global Reach Missile** "

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TECHNICAL FIELD:

The present invention relates to increasing the range of artillery shells by in-flight boosting and / or by changing the shape of the shell rear end to a pointed cone shape. Rocket assisted cannon shell increases the range from 18 miles to 22 miles but on the expense of payload of about 25% decreased explosives. Longer barrel such as that of Dr. Bull Supergun made in Iraq got the range of 90 miles. The shell accelerated longer time inside the long barrel by the expanding gunpowder in the cannon. Laurence Livermore Laboratory attempted to launch a satellite using more powerful explosive, dynamite instead of gunpowder. The pressure reaching much higher than 2,000 PSI ended in a disastrous explosion. In this invention the speed of the shell is increased after the shell has left the cannon's barrel by a in flight gun powder booster explosions and / or by reducing the drag through streamlining the shell and using a pointed back part instead of flat base.

BACKGROUND ART:

At present, the standard shell has a pointed front or tip and a flat base. The flat base causes a drag that decelerates the trajectory causing slowing down and a shorter range. Rocket assisted cannon shell increases the range from 18 miles to 22 miles but on the expense of payload. Longer barrel such as that of Dr. Bull Supergun made in Iraq got the range of 90 miles. Laurence Livermore Laboratory attempted to launch a satellite using more powerful explosive, dynamite instead of gunpowder with pressure reaching much higher than 2,000 PSI ended in a disaster of explosion. In this invention the speed of the shell is increased after the shell has left the cannon's barrel by a in flight gun powder boosters and / or by reducing the air drag near the flat base through streamlining the shell and using a cone shaped base instead of flat base.

Rocket assisted shell increased the range but the payload was diminished. Thus the increase in range was on the expense of diminished payload. However the increased range was mostly due to decreased drag caused by the rocket exhaust. The rocket speed is much slower that shell's speed. You can see a rocket moving but you can not see a flying bullet or cannon shell. So the concept of rocket force aiding that of the flying shell is not likely to speed up the flying shell. But the rocket exhausted gas reduces the drag that leads to increased range or retaining high in-flight speed.

In my system, the drag can be reduced by fastening a cone shaped light wood to streamline the airflow around the flying shell and reduce the drag. With a cone shaped base the firing power inside the barrel is not different from same power exerted on a cone shaped base. Integrating pressure on

the shell cone base in the coaxial direction of the barrel equals exactly the inside barrel pressure time the cross sectional area of the body of the shell, namely the base area of the flat base shell. So the cone tailed shaped shell will leave the barrel with equal speed to that of the flat based shell but the range of the cone shaped shell becomes longer than that of the flat based shell due to lowered drag.

With the gun or cannon, there are two kinds of recoil. The recoil of the shell mass accelerating inside the barrel is one. The second and bigger recoil is from the compressed gas bursts outside the cannon end opening. This second type of recoil caused by compressed gas bursting into the open is much bigger than that caused by the shell mass. This recoil is evidenced by firing a blank shell. In a celebration firing of a cannon or in a gun salute, the felt thick disk or cloth rags that are pressed inside the barrel. The gunpowder pushes out the rags with a noisy burst and with bigger recoil.

The recoil of long-range booster fastened to the base of the shell fires in midair to give a powerful recoil to the flying shell causing faster speed and higher altitude that results in longer range.

Using multiple boosters one firing after the other in mid air causes repeated recoils to speed up the shell height and range.

Using multiple boosters of gun powder inside a thin steel tube that is fastened to the shell base make the exploding booster in a confined space

burst when it leaves the barrel of the flying tube. A stronger burst causes stronger recoil to the flying shell.

Cannon or silo firing a whole long missile with inside multiple boosters makes the fired missile a fired shell starting with high speed. Instead of decelerating in mid flight the serially fired boosters make the flying missile faster but more importantly it keep the missile flying longer time.

With cannon or with Silos' fired long missile, the range is extended and if the cannon is pointing upwards, the missile might reach an orbiting level to become a satellite.

DISCLOSURE OF THE INVENYION:

The present invention relates to increasing the artillery range by changing the shape of the shell plus in-flight boosting the shell speed and height through serial booster explosions whose recoils push the shell faster and higher. The flat shape of the shell base is changed to a cone shape by fastening a wood cane to the base or folded flexible rubber or plastic sheet or expanding rings to make a cone tail of the shell. Fastening a booster filled with gun powder to the base of the shell with a delay primer fuse that explodes in flight get the recoil push the trajectory higher in the air and faster in speed to reach a longer range. Adding multiple boosters in tandem causes successive explosions in flight that the successive recoils speeds up the shell in-flight and increases the range. Fastening a round thin steel smooth barrel to the base of the shell and stacking multiple flat sides or cone shaped boosters separated by felt or plastic separators with center holes filled with slow burning primer adds more blank-type recoil to enhance shell speed and range. Fastening a long round steel barrel to the base of the shell or trajectory body to fired from a cannon or from a silos can give the trajectory enough speed and enough fuel to become a long range missile with a bomb tip or can become a satellite body that can reach orbiting level.

BRIEF DESCRIPTION OF THE DRAWINGS:

Fig. 1. Artillery round with shell 23, casing 21, and gunpowder 22.

Fig. 2. Booster casing with inner lid 28 and outer lids 30 and gunpowder filling 30.

Fig. 3. Artillery round with shell 23, booster 32, stabilizer 26 and gun powder 22.

Fig. 4. Shell 23, booster 38, and stabilizers 41, 42.

Fig. 5. Cannon 32, single boost 34, and boosted range 37.

Fig. 6. Shell 23, boosters 1, 2, & 3 with stabilizers 41 42.

Fig. 7. Flying gun boosting with shell 23, flying gun barrel 43, and stacked boosters 38, 39, and 40.

Fig. 8. Cannon-fired missile with tip 23 and shell body 44 and multiple boosters 40

Fig. 9. Three boosters trajectory from cannon 50, with boostings 51, 52, and 53 to increase normal range 54 to longer range 55.

Fig. 10. High drag flat bottom standard shell shape in casing 58.

Fig. 11. Streamlined shell with pointed base tip 61, normal body 62, and pointed tail 63 to minimize drag.

Fig. 12. Comparison of shape and mass, tip 61 unchanged, body 62 unchanged, mass 65 removed is equal to added mass 63. Mass unchanged will leave the barrel at

same speed as that on normal shaped shell but the drag is reduce and the range is increased.

Fig. 13. Flatbase shell with anti drag adapter 66 that upon leaving the barrel will expand to a cone type tail that reduces drag.

Fig. 14. Expanded view of anti drag outer component 67 attached to shell base 57 and slanted rings 68 that in flight change shape to cone tail.

Fig. 15. Shell tail transformed to a cone shape for reduced drag during flight.

Fig. 16. Anti drag ring 73, with lower lip 74 and inner rings with upper lips 75.

Fig. 17. Anti drag flexible cloth or rubber 77 folded against the shell flat base.

Fig. 18. In flight expanded rubber or cloth cone 78 to reduce drag.

Fig. 19. Wood or plastic foam cone 79 fastened to shell flat base 57 to reduce drag.

Fig. 20. Satellite 90 and satellite underground launcher 98 with satellite body 91 with boosters 93 and 96 and launcher 98 with boosters 100 and 101, gunpowder 103 and base 104 and ground level 99.

Fig. 21. Under ground or above ground satellite launcher 98 with boosters 100, 101, and 103, wall 106, gunpowder 103 and base 104.

Fig. 22. Booster with open pinhole at the top, gunpowder 96, lower end 107 and primer delay fuse 108.

Fig. 23. Cannon fired satellite with tip 90. Body 91, and boosters 96 and 109 and fins 95.

Fig. 24. One-way fire booster96with top plug 106 and lower plug 116. Upon explosion plug 116 is fired downwards causing upward recoil to the satellite in flight upwards. The plug has horizontal upper teeth or edge and slanted lower part. Upon explosion in side booster 111 only the lower plug is fired down while the upper plug remains stationary.

Fig. 25. Cannon-fired satellite with tip 90, body 91, and multiple boosters in tandem arrangement for serial firing while the in-flight upwards.

Detailed DESCRIPTION OF THE DRAWINGS:

Fig. 1. Artillery round with shell pointed tip 23, flat base 25, casing 21, gunpowder 22, primer capsule 24 that when hit by triggered hammer it burn to initiate firing of cannon or gun.

Fig. 2. Upper empty booster casing with inner lid 29 and outer lid 30 with delay fuse 31. Lower booster casing is filled with gunpowder 32 in cavity between inner lid 28 and outer lid 30 with delay fuse 31 in the center of the outer lid 30 and gunpowder filling 32.

Fig. 3. Artillery round with shell tip or cone-shaped tip 23, gun powders 32 in booster attached or epoxied to the flat base of the shell. Fine steel wire fins are attached to the flat base of the shell for in-flight stabilization with gunpowder 22 and capsule 24.

Fig. 4. In-flight shell 23 with booster 38 attached to its flat base, and stabilizers 41, 42. Delay fuse is a pinhole filled with sparkler or matches material of slow explosive burning rate. After about 500 – 800 feet from the cannon barrel the booster explodes and the recoil force pushes the flying shell faster causing the shell to go higher as well as farther.

Fig. 5. Trajectory of shell 23 fired by cannon 32 with mid-flight booster explosion at position 34. The recoil of booster explosion pushes the shell faster and higher to reach farther ground hit 37. Unboosted shell will hit ground at shorter or closer position 36.

Fig. 6. Shell 23, has 3 staged boosters 1, 2, & 3 with stabilizers 41 42. Booster 40 explodes in-flight in open air after half a second of leaving the cannon barrel. Booster 39 explodes anther half second later and booster 38 explodes a third half a second later. Three successive recoils push the trajectory higher and farther as seen inFig. 8

Fig. 7. Flying gun boosting with shell 23 base fixed or anchored to shell flat base. This shotgun is pointing backward and the recoil is much stronger than that of open booster. Flying shotgun barrel 43 has 3 stacked boosters 38, 39, and 40 and shell 23,

gets three strong staged boostings 1, 2, & 3.. Booster 40 explodes first in-flight after half a second of leaving the cannon barrel. Booster 39 explodes after another half second land booster 38 explodes a third half a second later. The third explosion of booster 38 has the maximum recoil that assists shell speed, height, and longer range. Three successive recoils from the flying shotgun pushes the trajectory higher and farther as seen in Fig. 8

Fig. 8. Cannon fired missile with shell 44, tip 23, booster series 40 and fins 45.

Fig. 9. Trajectory increased range by three successive boostings of shell fired by cannon 50, with boostings 51, 52, and 53 to increase normal range 54 to longer range 55.

Fig. 10. Standard flat bottom 57 shell 56 shape in casing 58 with gunpowder 59 and casing base 60.

Fig. 11. None flat base 63 tail shell with pointed tip 61, normal body 62, and pointed cone-shaped tail 63 for minimizing in-flight drag causing the trajectory to reach farther. Fin or small ball 64 stabilizes the shell in-flight and prevents tumbling that causes reduced range.

Fig. 12. Comparison of shape and mass, shell tip 61 is unchanged in mass or shape, main shell body 62 is unchanged too. But mass and shape of lower part of the shell is changed. Part 65 is removed and part 63 is added on to form a cone shaped tail that reduces drag and causes increased range. Unchanged mass shell will leave the barrel at same speed as that of flat base shell but the drag is reduced and the range is increased. Integrating the vertical component of inside barrel pressure over the cone surface of the cone shaped tail is exactly equal to the integrated force on the flat base are of the normal shell.

Fig. 13. Normal shape shell with anti drag 66 that upon leaving the barrel will expand to a cone type tail that reduces drag.

Fig. 14. Expanded view of anti drag outer component 67 attached to shell base 57 and slanted rings 68 that in flight change shape to cone tail.

Fig. 15. As the shell leaves the cannon's barrel the Bernoulli force puts negative pressure to open the rings of the anti drag fixture to form a cone shaped tail that reduces the in-flight drag. The flat base shell base is transformed to a cone shape for reduced drag during flight.

Fig. 16. Anti drag ring 73 affixed to the shell flat base. Lower lip 74 fits the adjacent inner rings upper lips 75 forming a stronger tail cone and reduction of in-flight drag.

Fig. 17. Anti drag flexible cloth or rubber 77 folded against the shell flat base with perforation to allow expansion to a cone shape in flight.

Fig. 18. In flight expanded rubber or cloth cone 78 to reduce drag, perforation 81 to allow expansion to a cone shape to reduce drag.

Fig. 19. Wood or plastic foam cone 79 fastened to shell flat base 57 to reduce drag.

Fig. 20. Satellite 90 and satellite underground launcher 98 with satellite body 91 with boosters 93 and 96 and launcher 98 with boosters 100 and 101, gunpowder 103 and base 104 and ground level 99.

Fig. 21. Under ground or above ground satellite launcher 98 with boosters 100, 101, and 103 , wall 106, gunpowder 103 and base 104.

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Fig. 25. Cannon-fired satellite with tip 90, body 91 and multiple boosters in tandem arrangement for serial firing while the in-flight upwards.